

PORTABLE TOILET SHELTER HAVING IMPROVED STACKABILITY
CROSS-REFERENCES TO RELATED APPLICATIONS

Not applicable.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable.

REFERENCE TO A MICROFICHE APPENDIX

Not applicable.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention generally relates to portable building structures. More specifically, this invention is directed to a collapsible and stackable portable toilet shelter that is easier to fold flatter, transport, and assemble than prior art toilet shelters, such that assembly time and shipping costs are reduced.

Description of the Related Art

Portable toilet shelters are widely used throughout the world for various uses such as at construction sites, festivals, and other point of use having large gatherings of people. Portable toilet shelters are shipped from a provider to a point of use in many ways including as fully assembled in one piece, completely disassembled into individual components, or partially assembled.

First, there are disadvantages with shipping a fully assembled portable toilet shelter. Very few such units can be transported at a time. For example, a bed of a pickup truck will accommodate only two fully assembled units. Such a small payload of units is not cost effective to ship to a customer.

Second, many prior art portable toilet shelters are shipped in a completely disassembled state. Unfortunately, this is also a problem since it takes such a long time to assemble each unit, and often requires two people to assemble each unit, resulting in excessive labor cost. For example, it can take up to an hour for two people to assemble just one completely disassembled unit. This is a particularly significant problem for deliveries of dozens of units that require many hours of labor for assembly and disassembly. Such a labor-intensive solution to the fully assembled shelter is not cost effective for shipping toilet shelters to a customer.

Another approach is to ship the portable toilet shelters in sub-assembly form. This approach is taught by U.S. Patent 4,493,118 to Braxton, the inventor hereof. Braxton discloses a collapsible portable toilet shelter having a base member, a roof panel, and a foldably collapsible rectangular enclosure therebetween. Basically, the toilet shelter is assembled by placing the base member on a surface, unfolding the rectangular enclosure, fitting the bottom of the rectangular enclosure to the base member, placing the roof panel to the top of the rectangular enclosure, and fastening the parts of the toilet shelter together. Uniquely, the rectangular enclosure includes a front wall, a back wall, and bi-fold side walls. Each bi-fold side wall is composed of forward and rearward panels connected by continuous hinge members. The rectangular enclosure collapses when the side panels are swung inwardly such that the forward and rearward panels fold toward each other so that the front wall and back wall collapse together toward one another. Therefore, the Braxton '118 solution provides a portable toilet shelter that assembles and disassembles easily and that can be shipped cost effectively to a customer.

One drawback with the Braxton '118 solution, however, is that the stacking and assembly of each portable toilet shelter is not optimized. The rectangular enclosure folds so that the front and back walls are parallel, or are aligned, with one another. Thus, the rectangular enclosure necessarily collapses to a stack height equal to at least four times the thickness of a wall, counting the front wall, forward and rearward panels of each side wall, and the back wall. Whether the units are transported in a vertical stack or a horizontal stack, the more each unit can be collapsed, the more units can be shipped on the same size truck to save on shipping costs. Similarly, the easier it is to assemble each unit, the less labor hours are required to save on labor costs. Ultimately, a more efficient portable toilet design would translate into cost savings and convenience to the public.

From the above, it can be appreciated that portable toilet shelters of the prior art are not fully optimized to improve the stackability and assembly characteristics thereof and thereby reduce the costs associated therewith. Therefore, what is needed is a more efficiently stackable, less costly to transport, and easier to assemble portable toilet shelter.

BRIEF SUMMARY OF THE INVENTION

According to the preferred embodiment of the present invention, there is provided a portable toilet shelter having a loop enclosure that is mountable to a base, and adapted to receive a roof. The loop enclosure includes opposed end walls each having opposed edges, and further includes opposed side walls positioned between the opposed end walls with each of the side walls having opposed edges. The loop enclosure also includes flexible hinges for connecting the edges of the side

walls to respective adjacent edges of the end walls such that the end walls and side walls complete the loop enclosure.

The portable toilet shelter is partially disassembled when the roof is removed, the loop enclosure is lifted away from the base, and the loop enclosure is collapsed wherein the end walls fold respectively toward the side walls, such that each of the end walls overlays a respective one of the side walls. Accordingly, the overall height of the collapsed portable toilet shelter is roughly equivalent to the thickness of two walls. Conversely, the portable toilet shelter is partially erected when the end walls are unfolded respectively away from the side walls. In this position, the walls are unfolded to position the side walls substantially parallel to one another and the end walls substantially parallel to one another, wherein the side walls are substantially respectively transverse to the end walls to form an enclosure. Accordingly, the loop enclosure is unfoldable to be capable of maintaining an upright and self-supporting position. Thus, the present invention is capable of providing a portable toilet shelter that is more compact, more stackable, and easier to assemble and disassemble than any prior art shelter, and is therefore more cost effective.

It is an object of the present invention to provide a more stackable toilet shelter compared to those of the prior art. Approximately 150 portable toilet shelters of the present invention can be shipped on an standard 53 foot long semi-truck trailer, which is eight times the number of fully assembled shelters and two times the number of foldable prior art shelters that can be shipped on the same size truck trailer.

It is another object that the present invention is capable of disassembly by one person and is easier to assemble and disassemble than prior art collapsible

toilet shelters. Fully disassembled prior art toilet shelters require about a half an hour to assemble and disassemble, and the folding prior art shelters require about ten minutes to assemble and disassemble. In contrast, the portable toilet shelter of the present invention requires only about five minutes to assemble and disassemble by one person.

It is still another object that the present invention will save on shipping costs and labor costs due to the improved stackability and assembly of the portable toilet shelter.

These objects and other features, aspects, and advantages of this invention will be more apparent after a reading of the following detailed description, appended claims, and accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 is a perspective view of the portable toilet shelter according to the preferred embodiment of the present invention;

Fig. 2 is an enlarged view of a corner of the portable toilet shelter of Figure 1;

Fig. 3 is a partially cutaway perspective view of the portable toilet shelter of Figure 1;

Fig. 4 is an enlarged perspective view of a support as used in the portable toilet shelter of Figure 3;

Fig. 5 is a perspective view of a toilet unit as used in the portable toilet shelter of Figure 3;

Fig. 6 is a partially cutaway perspective view of a portable toilet shelter according to an alternative embodiment of the present invention;

Fig. 7 is a top view of the portable toilet shelter according to the preferred embodiment, not showing the toilet unit;

Fig. 8 is a top view of a loop enclosure of the portable toilet shelter of Figure 1, wherein the loop enclosure is being collapsed;

Fig. 9 is a top view of the loop enclosure of Figure 8 as fully collapsed; and

Fig. 9A is a top view of a loop enclosure of the portable toilet shelter of Figure 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the Figures, there is shown in Figure 1 a portable toilet shelter 10 that is constructed in accordance with the present invention. Uniquely, the portable toilet shelter is hinged along each of its four corners 12 with flexible hinge strips 14. Preferably, as shown in Figure 2, the flexible hinge strips 14 are fastened to the portable toilet shelter 10 with rivets 16, but may also be integrally fastened thereto using any other method including thermoforming or heat lamination techniques. The novel and unobvious aspects of the present invention apply not only to toilet shelters, but also apply to any other types of portable shelters. Other types of portable shelters include but are not limited to changing rooms, hand wash stations, first aid buildings, and the like.

Preferably, and as better shown in Figure 3, the toilet shelter generally includes a base 18, a commode, tank, or toilet unit 20 mounted to the base 18, a loop enclosure 22 circumscribing the base, and a roof 24 mounted to the loop enclosure 22. The base 18 is preferably constructed of wood, such as from a standard square pallet. The base 18 also preferably includes a non-skid floor material as a sanitary top

surface of the base 18. Alternatively, the base 18 can be produced from plastic or any other cost-effective material. A toilet seat 26 is mounted to the toilet unit 20 and a urinal 28 is mounted either to a portion of the loop enclosure 22 or is mounted directly to the toilet unit 20 itself. Nonetheless, the urinal 28 drains to the toilet tank 20 as is well known in the art, such as with a flexible tube. A stackpipe 20A extends upward from the toilet unit 20 and out of the roof of the toilet shelter. Such base 18 and toilet unit 20 construction is well-known in the art and is consistent with Porta-John® brand portable toilets. Alternatively, it is possible to not use the base 18 at all, or rather, use level ground as the base 18.

Circumscribing the base 18, the loop enclosure 22 is preferably constructed of a loop of walls including a front end wall 30, a back end wall 32, and left and right side walls 34 and 36 connected therebetween. The term loop is not limited herein to only circular or closed loop structures. Those skilled in the art will appreciate that each of the individual walls are preferably made of polyethylene, but can alternatively be made from wood or any other cost effective material. As is well known, the front end wall 30 includes a door 38 to permit access to the interior of the portable toilet shelter 10 through the front end wall 30. Located between the base 18 and the loop enclosure 22 at each of the four corners 12 are four angled supports 40, as also shown in Figures 4 and 7. The angled supports 40 are preferably fastened to the inside of the loop enclosure 22 with a hook and loop fastener material 40A, as shown in the enlarged view of Figure 4. Accordingly, the angled supports 40 act as gussets to help rigidify the inside of the loop enclosure 22 at the corners 12 thereof. Additionally, the angled supports 40 snugly locate the base 18 within the loop enclosure 22.

Figure 5 illustrates another aspect of the present invention wherein the toilet unit 20 includes a tank portion 42 having a lid 44 pivotably connected thereto by hinges 46. This fliptop arrangement facilitates improved waste removal from the tank portion 42 and enables storing the urinal 28 within the tank portion 42 for better transportability of the portable toilet shelter 10.

Figure 6 illustrates a portable toilet shelter 110 according to an alternative embodiment of the present invention wherein the roof 24 and a floor 48 are hingedly connected to the loop enclosure 22 with flexible hinge strips 14. The hinged roof 24 and floor 48 facilitate assembly and disassembly, and increase the strength of the portable toilet shelter 110 by integrating the components thereof. The floor 48 also provides an improved barrier against entry by vermin such as small mice and rats that can squeeze through spaces between the base and walls of prior art structures.

As best shown between Figures 6 and 7, the front end wall 30 of the loop enclosure 22 further includes top and bottom longitudinal ends 30A and 30B, an inward surface 30C, and left and right vertical edges 30D and 30E. Similarly, the back end 32 wall includes top and bottom longitudinal ends 32A and 32B, an inward surface 32C and left and right vertical edges 32D and 32E. The left side wall 34 also includes top and bottom longitudinal ends 34A and 34B, an inward surface 34C, and front and rear vertical edges 34D and 34E. Finally, the right side wall 36 includes top and bottom longitudinal ends 36A and 36B, an inward surface 36C, and front and rear vertical edges 36D and 36E. As shown, the right vertical edge 30E of the front end wall 30 extends longitudinally parallel with and transversely normal to the front vertical edge 36D of the right side wall 36, and the rear vertical edge 36E of the right side wall 36 extends longitudinally parallel with and transversely normal to with the

right vertical edge 32E of the back end wall 32. Similarly, the left vertical edge 32D of the back end wall 32 extends longitudinally parallel with and transversely normal to the rear vertical edge 34E of the left side wall 34, and the front vertical edge 34D of the left side wall 34 extends longitudinally parallel with and transversely normal to with the left vertical edge 30D of the front end wall 30 to establish the loop.

To close the loop, the walls 30, 32, 34, and 36 are interconnected by the flexible hinge strips 14, which are preferably composed of fabric woven from any durable and flexible material such as nylon. Alternatively, the flexible hinge strips 14 could be constructed in any other cost effective manner, such as with sheet material, wire, some types of metal hinges, or any other flexible material. It is contemplated that the loop enclosure 22 not always be fixedly closed by the flexible hinge strips 14. In other words, it is possible to have one of the flexible hinge strips 14 be easily removably attached to one of the four walls 30, 32, 34, and 36, to permit the loop enclosure 22 to be completely unfurled to a flat state. At the bottom of the loop enclosure 22, the bottom longitudinal ends 30B, 32B, 34B, and 36B of each of the walls 30, 32, 34, and 36 together define a bottom end 50 of the loop enclosure 22, circumscribe the base 18, and can be fastened to the base 18 by any well known method such as using screws, X-tree fasteners, and the like. However, when using the angled supports 40 it is not necessary to fasten the loop enclosure 22 to the base 18, since the angled supports 40 frictionally interpose the loop enclosure 22 and the base 18 to provide sufficient stability for the portable toilet shelter 10.

Likewise, the roof 24 mounts to the loop enclosure 22 either independently or hingedly to complete the portable toilet shelter 10. The top longitudinal ends 30A, 32A, 34A, and 36A of each of the walls 30, 32, 34, and 36

together define a top end 52 of the loop enclosure 22. The roof 24 is mounted to the top end 52 of the loop enclosure 22, preferably circumscribing the top end 52 as shown and being fastened with screws, X-tree fasteners, or the like. The roof 24 is a substantially square piece, preferably formed from polyethylene and includes a stackpipe vent 24A.

Disassembly and assembly of the portable toilet shelter 10 is easier than prior art structures and requires only about five minutes by an experienced service person. The portable toilet shelter 10 is more easily disassembled than the toilet shelters of the prior art. The roof 24 is removed by unscrewing or shearing off the fasteners, lifting the roof 24 off the top end 42 of the loop enclosure 22, and loading the roof 24 to a truck. Alternatively, according to the portable toilet shelter 110 of Figure 6, the roof 24 can be pivotably lifted off the top longitudinal end 52 of the loop enclosure 22.

Then, the loop enclosure 22 is lifted away from the base 18 and is placed on its side permitting it to automatically fold flat on the ground, as depicted by Figures 8 and 9. As shown in Figure 9, when the loop enclosure is placed on its side and permitted to collapse, the front and back end walls 30 and 32 fold relatively toward respective side walls 34 and 36. In other words, the walls 30, 32, 34, and 36 collapse toward one another such that the inside surface 30C of the front end wall 30 overlays one of the inside surfaces 34C or 36C of one of the side walls 34 or 36, while the inside surface 32C of the back end wall 32 overlays the other of the inside surfaces 34C or 36C of the side walls 34 or 36. Additionally and alternatively according to the collapsed portable toilet shelter 110 of Figure 9A, the roof 24 and floor 48 can be collapsed and folded together with the loop enclosure 22.

Finally, once the loop enclosure 22 is set aside or loaded to a truck, the emptied toilet unit 20 is removed from the base 18 and loaded to a truck and the base 18 is then lifted from the ground and loaded to a truck. Accordingly, the compact collapsed loop enclosure 22 can be stacked in any convenient manner to maximize the number of units transportable by a truck. As used herein, the term overlay is synonymous with superimpose and is not limited herein to exact matching alignment of one wall over another. Rather, the term means that one wall substantially covers another with surface area misalignment permissible.

The portable toilet shelter 10 is also easier to assemble than toilet shelters of the prior art. First, the base 18 is positioned on level ground. Then the toilet unit 20 is mounted atop the base 18. Next, the loop enclosure 22 is easily opened from its collapsed condition as shown in Figure 9 to a self-supporting condition by spreading the walls away from one another. Consequently, the side walls 34 and 36 are positioned substantially parallel to one another, the end walls 30 and 32 positioned substantially parallel to one another, and thus the side walls 34 and 36 are substantially transverse to the end walls 30 and 32. The angled supports 40 are removably fastened to the inside of corners 12 of the bottom end 50 of the loop enclosure 22 for rigidity. From this self-supporting position, the loop enclosure 22 is lifted over the toilet unit 20 and the bottom end 50 is easily aligned with the perimeter of the base 18 such that the bottom end 50 of the loop enclosure 22 circumscribes the base 18 and angled supports 40. Thus, it is not necessary to struggle with prior art bi-fold side walls, by trying to keep the bi-fold sides fully open and straight so as to align with the perimeter of the base. As such, the present invention is easier to assemble and therefore takes less time to do so. Once the loop enclosure 22 is firmly in place,

the roof 24 is placed to the top end 52 of the loop enclosure 22 and is fastened thereto. Finally, the stackpipe 20A is attached to the toilet unit 20.

According to the alternative embodiment of Figures 6 and 9A, the portable toilet enclosure 110 is assembled first by opening the loop enclosure 22 such that the walls are substantially square to one another. The floor 48 is then flipped into place at the bottom end 50 of the loop enclosure 22. Then the angled supports 40 are removably fastened to the inside of corners 12 at the bottom end 50 of the loop enclosure 22. The base 18 is then inserted into the loop enclosure 22 through the door 38 and placed on the floor 48 inside of the angled supports 40. The toilet unit 20 is then dropped into the loop enclosure 22 either through the open top end 52 or through the door 38. The roof 24 is then flipped over into place such that it circumscribes the top end 52 of the loop enclosure 22. Finally, the stackpipe 20A is attached to the toilet unit 20.

While the present invention has been described in terms of a preferred embodiment, it is apparent that other forms could be adopted by one skilled in the art. In other words, the teachings of the present invention encompass any reasonable substitutions or equivalents of claim limitations. For example, the structure, materials, sizes, and shapes of the individual components could be modified, or substituted with other similar structure, materials, sizes, and shapes. One specific example includes using a tri-fold design, or other geometry, instead of the quad-fold design disclosed herein. Those skilled in the art will appreciate that other applications, including those outside of the portable toilet shelter industry, are possible with this invention. Accordingly, the present invention is not limited to only